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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,721	10/31/2003	Philip J. Pietraski	I-2-0433.1US	1573

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EXAMINER	
LAM, DUNG LE	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/698,721	PIETRASKI, PHILIP J.	
	Examiner	Art Unit	
	DUNG LAM	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,12-16 and 32-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,12-16 and 32-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claim(s) **1, 12 and 32** are rejected under 35 U.S.C. 103(a) being unpatentable over **Qui** (US Pub. No. 20020097686) in view of **Gaal** (US 2004/0203475) further in view of **Admitted Prior art** (The background of the invention of the present application [0010]).

2. Referring to claim **1, Qui** teaches a method for providing feedback regarding the quality of a communication channel which is transmitted between a transmitter and a receiver ([0014]); the method comprising:

- receiving a downlink data communication ([0016]);
- performing at least one current quality measurement on said downlink data communication to determine the current quality of said downlink data channel (obtain CSI, [0016]);
- deriving, based on said performing step, a predictive channel quality indication (CQI) estimating the future quality of said downlink data channel on a per multiple slots basis ([19, 25,22]) and

- transmitting said predictive CQI wherein said predictive CQI includes at least one of a recommended transport block size, modulation format, or number of codes ([20-21, 25, 26, 45]).

Qui teaches deriving/obtaining the future quality of said downlink on a per multiple time slot*s* basis but not on *a per* time slot basis. In an analogous art, **Gaal** teaches obtaining channel quality indication on a per time slot basis (C/I ratio estimate can be performed in every time slot, [25, 29, 33, 47]). The examiner notes that the concept of obtaining a channel quality indication on a per time slot basis is not novel because it is a matter of design choice. A network designer can choose to obtain/derive a channel quality indication value every five time slot basis or every one time slot basis depending on how fast the designer would like the system to respond to a change in channel quality. The more often the channel quality indication is obtained, the faster the system can respond. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Qui's teaching of deriving a predictive CQI at a faster frequency on per a time slot as suggested by **Gaal's** teaching of obtaining the channel quality on a time slot basis. This modification of a faster frequency of deriving the channel quality indication on a time slot basis would yield an increase in response time to signal fading and thus faster adjustment can be made to improve signal quality.

However, Qui and Gaal do not teach the concept of sending the CQI to Node B. However, the background of the invention of the present application (Admitted Prior art) discloses that the UE sends CQI to the Node B to set the transmission parameters ([0010] and step 114 of Prior art Fig. 1). Therefore, it would have been obvious for one

of ordinary skill in the art at the time of the invention to combine said references with the prior art's teaching of sending the CQI from the UE to Node B to facilitate the feedback process and thus allow Node B modify the transmission parameters more effectively.

3. Referring to **claim 12**, **Qui** teaches a method for providing channel quality measurements on a downlink communication ([0014]); the method comprising:

- monitoring said downlink communication channel at said receiver ([16]);
- performing at least one current measurement on said downlink communication channel to determine the current quality of said downlink data channel ([0016]);
- deriving, based on said performing step, a predictive channel quality indication (CQI) estimating the future quality of said downlink data channel ([0019, 25]); and
- transmitting said predictive CQI from said receiver to said transmitter wherein said predictive CQI includes at least one of a recommended transport block size, modulation format, or number of codes ([20-21, 25, 26, 45]), a per multiple slots basis ([19, 25,22]) and

Qui teaches deriving/obtaining the future quality of said downlink on a per *multiple* time slot*s* basis but does not teach *a per* time slot basis. In an analogous art, **Gaal** teaches obtaining channel quality indication on a per time slot basis (C/I ratio estimate can be performed in every time slot, [25, 29, 33, 47]). The examiner notes that the concept of obtaining a channel quality indication on a per time slot basis is not novel because it is a matter of design choice. A network designer can choose to obtain/derive

a channel quality indication value every five time slot basis or every one time slot basis depending on how fast the designer would like the system to respond to a change in channel quality. The more often the channel quality indication is obtained, the faster the system can respond. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Qui's teaching of deriving a predictive CQI at a faster frequency on per a time slot as suggested by **Gaal's** teaching of obtaining the channel quality on a time slot basis. This modification of a faster frequency of deriving the channel quality indication on a time slot basis would yield an increase in response time to signal fading and thus faster adjustment can be made to improve signal quality.

However, Qui and Gaal do not teach the concept of sending the CQI to Node B. However, the background of the invention of the present application (Admitted Prior art) discloses that the UE sends CQI to the Node B to set the transmission parameters ([0010] and step 114 of Prior art Fig. 1). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine said references with the prior art's teaching of sending the CQI from the UE to Node B to facilitate the feedback process and thus allow Node B modify the transmission parameters more effectively.

4. Referring to **claim 32**, **Qui** teaches a method for providing feedback regarding the quality of a communication channel which is transmitted between a transmitter and a receiver ([14]);

- the method comprising: receiving a downlink data communication ([0016]); receiving a said pilot channel communication ([0016]);
- performing at least one current quality measurement on said downlink data communication and said pilot channel communication to determine the current quality of said downlink data channel (0016);
- deriving, based on said performing step, a predictive channel quality indication (CQI) estimates the future quality of said downlink data channel ([19, 25]) a per multiple slots basis ([19, 25,22]) and
- transmitting said predictive CQI from said receiver to said transmitter wherein said predictive CQI includes at least one of a recommended transport block size, modulation format, or number of codes ([20-21, 25, 26, 45]).

Qui teaches deriving/obtaining the future quality of said downlink on a per *multiple* time slot*s* basis but not on *a per* time slot basis. In an analogous art, **Gaal** teaches obtaining channel quality indication on a per time slot basis (C/I ratio estimate can be performed in every time slot, [25, 29, 33, 47]). The examiner notes that the concept of obtaining a channel quality indication on a per time slot basis is not novel because it is a matter of design choice. A network designer can choose to obtain/derive a channel quality indication value every five time slot basis or every one time slot basis depending on how fast the designer would like the system to respond to a change in channel quality. The more often the channel quality indication is obtained, the faster the system can respond. Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Qui's teaching of deriving a predictive CQI at a faster

frequency on per a time slot as suggested by **Gaal's** teaching of obtaining the channel quality on a time slot basis. This modification of a faster frequency of deriving the channel quality indication on a time slot basis would yield an increase in response time to signal fading and thus faster adjustment can be made to improve signal quality.

However, Qui and Gaal do not teach the concept of sending the CQI to Node B. However, the background of the invention of the present application (Admitted Prior art) discloses that the UE sends CQI to the Node B to set the transmission parameters ([0010] and step 114 of Prior art Fig. 1). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to combine said references with the prior art's teaching of sending the CQI from the UE to Node B to facilitate the feedback process and thus allow Node B modify the transmission parameters more effectively.

5. Claim(s) **1, 12 and 32** are further rejected under 35 U.S.C. 103(a) being unpatentable over **Balachandran** (EP0899906) in view of **Raitola** (US 7,336,629)

6. Referring to claim **1**, **Balachandran** teaches a method for providing feedback regarding the quality of a communication channel which is transmitted between a transmitter and a receiver ([0014]); the method comprising:

- receiving a downlink data communication ([0040]);
- performing at least one current quality measurement on said downlink data communication to determine the current quality of said downlink data channel ([0016, 40]);

- deriving, based on said performing step, a predictive channel quality indication (CQI) estimating the future quality of said downlink data channel ([30]) and
- transmitting said predictive CQI wherein said predictive CQI includes at least one of a recommended transport block size ([30, 40]), modulation format, or number of codes.

Balachandran teaches making measurements on a per multiple time slots basis but not on *a* time slot basis. In an analogous art, **Raitola** teaches obtaining channel quality indication on a per time slot basis (C3 L37-50). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify **Balachandran**'s teaching of deriving a predictive CQI and on a time slot basis as taught by Raitola to increase the response time to signal fading and faster adjustment can be made to improve signal quality (C2 L10-25).

- Regarding claims **12 and 32**, they are claims that have the same limitations as claims 1, thus are rejected for the same reasons.

7. Claims **2-3, 13-14 and 33-34** are rejected under 35 USC 103(a) as being unpatentable **Qui, Admitted Prior Art and Gaal in view of Bergel** (U.S. Publication No. 2004/0142698).

8. Referring to claims **2, 13 and 33**, **Qui** does not explicitly teach including storing said at least one current quality measurement (0026 and Figure 4B). In an analogous art, **Bergel** teaches the step of storing at least one current quality measurement (S120, [0048, 0049] and Figure 4B). Therefore, it would have been obvious for one of ordinary

skill in the art skill in the art at the time of the invention was made to combine the admitted prior art's teaching of deriving a predictive CQI with Bergel's teaching of storing at least one current quality measurement to compare the past and present values to provide a more accurate estimate value.

9. Claims **4, 15 and 35** are rejected under 35 USC 103(a) as being unpatentable over **Qui, Gaal and Bergel** and further in view of Koorapaty et al. (U.S. Patent Publication No. 2003/0129992, hereinafter **Koorapaty**).

10. Referring to claims **4, 15 and 35, Qui, Gaal and Bergel** teach the limitations of claims 4, 15 and 35, but do not teach storing predicted values. **Koorapaty** et al. teaches storing predicted values [0010]. Therefore at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Koorapaty of storing predicted values to compare the predicted values with the measured values ([0012]).

11. Claims **5,16 and 36** are rejected under 35 USC 103(a) as being unpatentable over **Qui** in view of Bruckert et al. (U.S. Patent No. 5,305,468, hereinafter **Bruckert)**

12. Referring to claims **5, 16 and 36, Qui, Admitted Prior Art and Gaal** teach the limitations of claims 1, 12 and 32, but do not teach wherein said deriving step utilizes a linear predictive algorithm to derive the predicted value. In an analogous art, **Bruckert** et al. teaches wherein said deriving step utilizes a linear predictive algorithm to derive the predicted value (Column 4, Lines 42-45). Therefore, it would have been obvious for one of ordinary skill in the art at the to combine the teaching of **Qui, Admitted Prior Art and Gaal** with the teaching of Bruckert et al. wherein said deriving step utilizes a linear

predictive algorithm to derive the predicted value to provide a more accurate power control command (Column 1, Lines 47-49).

Allowable Subject Matter

Claims 3, 14 and 33 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments with respect to claims *1-5, 12-16 and 32-36* have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Harper can be reached on (571) 272-7605. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/VINCENT P. HARPER/

Supervisory Patent Examiner, Art Unit 2617